Protection From Falling Loads

- Keep materials or equipment at least 2 feet from the edge of excavations.
- Remove loose rock or soil or install protective barricades.
- Work on faces of slope or bench only if the employees below are protected from falling material.
- Do not stand or work under moving loads.
- Stand away from vehicles being loaded or unloaded.
- Use warning systems (barricades, signals, stop logs) to alert operators to the edge of an excavation.

The Effect of Water Accumulation

Water can undermine the sides and soil in an excavation. To divert surface water, OSHA standards require the use of diversion ditches, dikes, or other suitable measures as well as adequate drainage of the adjacent area. In addition, a competent person must inspect excavations subject to runoffs from heavy rains.

Hazardous Atmospheres

A competent person must test atmospheres when:

- an excavation is deeper than 4 feet.
- an oxygen deficiency or a hazardous atmosphere may be present.

Access and Egress

- OSHA requires safe access and egress to all excavations.
- Ladders, steps, ramps, or other safe means of exit are required in trench excavations 4 feet or deeper.
- Devices must be located within 25 lateral feet of workers.
- Ramps or runways and components must be joined in a manner to prevent tripping and have a non-slip surface.
- Workers must be able to walk earthen ramps in an upright position.

Pier Holes and Confined Footing Excavations

- A harness with a lifeline is required.
- An observer must be on hand to ensure that the lifeline is working properly and must maintain communication with the employee.

New England Laborers' Health & Safety Fund

410 South Main Street, Providence, RI 02903
Phone: (401) 621-5355
Fax: (401) 621-5603
www.nelhsf.com

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Excavations and Trenches

can you dig it?

New England Laborers' Health & Safety Fund

OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. This can include excavations for anything from footings to highways.

A trench is defined as a narrow underground excavation that is deeper than it is wide, and no wider than 15 feet.

Excavations + Trenches = Dangerous Operations

OSHA requires that workers in trenches and excavations be protected, and that safety and health programs address the variety of hazards they face.

What Are the Dangers?

- Cave-ins
- Falling Loads
- Water Accumulation
- Hazardous Atmospheres
- Access and Egress/Falls

Cave-ins pose the greatest risk for accidents and fatalities. A cubic yard of soil can weigh over 3,000 pounds (a Volkswagen Beetle). A person buried under only a few feet of soil can suffocate in as little as three minutes.

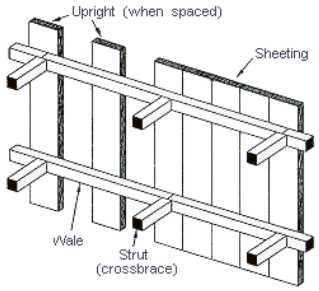
Preventing Cave-ins

OSHA requires the use of protective systems if an excavation is 5 feet or greater in depth (shallower sites if the competent person sees signs of a potential cave-in). Protective systems include shoring, shielding, and sloping.

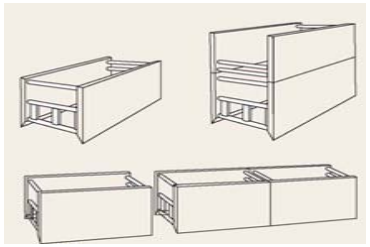
Shoring system—is a structure that supports the sides of an excavation to prevent cave-ins. It is a combination of wales (horizontal rails), uprights (vertical rails), sheeting, and struts (crossbraces).

Types include:

- Timber
- Mechanical
- Hydraulic

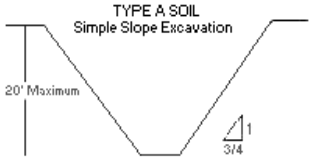


Shield system (trench box)—is a protective box or frame that is able to withstand the forces of a cave-in.



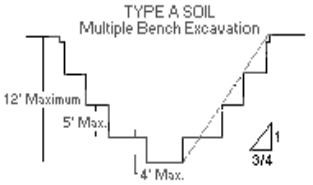
- The shield must extend at least 18 inches above the level of materials that could cave or roll into the trench.
- Never move boxes with personnel inside.
- Stack boxes only if they are designed for that purpose.
- Never stack shields from different manufacturers.

Sloping and benching—protects workers from cave-in hazards by excavating the sides so that they are inclined away from the excavation.



Slope excavation

- Angle of incline depends on soil type, environmental conditions of exposure, and application of surcharge loads.
- Their use is limited to the amount of available space.



Bench excavation

To protect from unstable structures in and adjacent to excavations (buildings, walls, sidewalks), OSHA requires support systems such as shoring, bracing, or underpinning.